



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,059	07/10/2001	Constantin Bulucea	NS-4971US	9375

7590 04/21/2004  
Ronald J Meetin  
210 Central Ave  
Mountain View, CA 94043-4869

EXAMINER

FARAHANI, DANA

ART UNIT PAPER NUMBER

2814

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/903,059

Applicant(s)

BULUCEA, CONSTANTIN

Examiner

Dana Farahani

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17-88 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-88 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 17-31, 38-67, 69 and 71-88 are rejected under 35 U.S.C. 102(e) as being anticipated by Litwin et al., hereinafter Litwin (U.S. 6,100,770), previously cited.

Regarding claims 17-19, 21, 23-28, 38, 41, 43-46, 53, 61, 67, 69, 70-72, and 79-83, Litwin discloses in figure 4 a structure comprising a varactor which comprises a plate region 13 and a body region 12 with plate electrode 17 and a body electrode 19; a dielectric 15 of figure 1 is over the body region, the gate voltage being held constant while the body voltage is varied, and a gate electrode 16 of figure 4 (see column 5, lines 58-67). Note that applying, and varying a voltage, which results in creation of an inversion layer, adds no structural limitations to the device. Nevertheless, Litwin discloses at column 5, lines 58-67, that CA and CB are fixed potentials, and a suitable voltage applied to well 12 to control the capacitance. Also, it is mentioned that one of the CA and CB can be fixed,

Art Unit: 2814

while the other varies, hence the limitation "body voltage ... differ from the plate-to-body voltage and to vary as a function of the plate-to-body voltage as the plate-to-body-voltage is varied".

Regarding claims 20, 29, 30, 39, 40, and 73, capacitance dependency on the plate area, an inversion layer in the body region, and dependency of the capacitance on the inversion area all are inherent properties of the device.

Regarding claims 47-52, 55, 56, 57-60, 63, 75-78, and 85-88, see figure 6 and column 6, lines 18-67, wherein there is a capacitance signal path through capacitor Cext, the plate and body electrodes of either V1 or Vn is in that path. Also, there are inductors L1 and L2 to function with either of the varactors.

Regarding claims 22, 31, 33-37, 42, 54, 62, 64-66, 74, and 84, see figure 10, and column 8, lines 52-67, wherein there is finger portions shown in the figure at least one of them (90 and 91) continuous with the main plate portion extending laterally away from it and meeting the body region there along.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 32-37, 68 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Litwin as applied to claims rejected above under 35 U.S.C. 102(e), and further in view of the Japanese patent issued to Misu et al. (ID#:07226643), a newly cited reference.

Litwin discloses the claimed invention, as discussed above, except for at least two of the finger portions are non-parallel to another.

The Japanese patent discloses in figures 7 and 9, and the paragraph titled PURPOSE, that unparallel conductive finger shaped regions in a device prevents the crossing part of the same center frequency from continuing. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the finger shaped electrodes in Litwin's structure unparallel to one another in order to prevent some parts of the frequency from crossing the region in which the finger shaped electrodes are being used.

### ***Response to Arguments***

5. Applicant's arguments filed on 1/14/04 have been considered but they are not persuasive.

Applicant argues, after an analysis of the operation of the device in the Litwin reference, that the gate electrode in the reference and the well region both have the same connection to electrode CB, and therefore, have a zero voltage difference. Applicant concludes that the limitation in the claims namely, the gate-to-body voltage being maintained at a non-zero value is not met. While this is what is shown in the reference, note that Litwin discloses at column 5, lines 63 and 64, "the device may also be operated by applying fixed potentials to the electrodes CA and CB and controlling the capacitance of the device by a suitable voltage applied to the well". Clearly, another operational mode of the varactor in the reference is directly applying a voltage to the well. Now, another operational mode is electrode CA fixed, while electrode CB varies along with the well (body) voltage; that is one of the CA and CB varies with the well voltage, since it is connected to the well, while the other electrode that is not connected to the well is fixed (again, see column 5, lines 59-67). But the fact that the Well and one of the electrodes have the same potential does not mean that the constant value is zero, rather it could be any voltage other than zero. This is as same as operational modes, correctly

Art Unit: 2814

for the most part, described by the applicant (3A2 and 3B2), but the potential between the gate and well need not be zero (mode 3A2, part (c) on page 17 of the applicant's arguments). That is, also the differential potential between the gate and well could be zero in that mode, but it could as well be a value greater than zero. Note that claim 71 requires that the gate-to-body voltage being constant at a non-zero value. In another words, the voltage difference between the gate and the well is zero, but they could be held at a non-zero voltage and still have the same value (voltage), which is a constant value, let's say C, where C is a non-zero numerical constant.

Regarding applicant's argument that the capacitance of the claimed invention undergoes an abrupt change in value as the inversion layer appears and disappears, note that the device of Litwin inherently has this feature by applying the appropriate constant voltages to the appropriate electrodes, while varying the voltage to the remaining electrodes in the structure.

Regarding applicant's argument that in the Misu reference, the electrode fingers are parallel to each other, what was referred to in the last Official Action, is figures 7 and 8 themselves that show the dark fingers are not along an straight line, and therefore, are not parallel to each other.

All the applicant's arguments are believed to be considered and replied to accordingly.

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the

Art Unit: 2814

mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703)308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani  
April 17, 2004

*Wael Fahmy*  
SPE 2814